

Appl. No.: 10/607,805

Filed: June 27, 2003

Page 2

Amendments to the Claims:

1. (Currently amended) A grinding ball having a hardened outer section of tempered martensite wherein said ball has been stress relieved to stabilize said ball against break up and/or spalling by developing an outer stress relieved martensitic shell, said ball being heated to its previous equalization temperature of its earlier tempering process so as to develop an outer stress relief martensitic shell by reducing circumferential compressive stresses in said hardened outer section without appreciably reducing hardness in the outer shell.
2. (Original) A grinding ball of claim 1 wherein said martensitic shell has a hardness of 55 to 65 Rockwell C.
3. (Original) A grinding ball of claim 2, wherein said martensitic shell has a hardness of 60 to 65 Rockwell C.
4. (Original) A grinding ball of claim 1 wherein said ball has a chemistry of:

carbon	.70 - 1.30% by weight
manganese	.60 - 1.00% by weight
silicon	.10 -.40% by weight
chromium	residual levels - 1.00% by weight
molybdenum	residual levels - 0.5% by weight.
5. (Original) A grinding ball of claim 1, wherein said ball is less than 8 cm in diameter and said martensitic section extends to ball core.
6. (Original) A grinding ball of claim 1 wherein said ball is greater than 8 cm in diameter and said stress relieved martensitic section reduces circumferential internal compressive stresses in the outer martensitic section and thereby stabilizes said ball against break up as

Appl. No.: 10/607,805

Filed: June 27, 2003

Page 3

caused by balancing tensile stresses in the pearlitic core exceeding the tensile strength of the core.

7. (New) A grinding ball having a hardened section of tempered martensite wherein said ball has been stress relieved to stabilize said ball against break up and/or spalling by developing an outer stress relieved martensitic shell, said ball having a chemistry of:

carbon	.70 - 1.30% by weight
manganese	.60 - 1.00% by weight
silicon	.10 - .40% by weight
chromium	residual levels - 1.00% by weight
molybdenum	residual levels - 0.5% by weight.

8. (New) A grinding ball having a hardened section of tempered martensite wherein said ball has been stress relieved to stabilize said ball against break up and/or spalling by developing an outer stress relieved martensitic shell, said ball being greater than 8 cm in diameter and wherein said stress relieved martensitic section reduces circumferential internal compressive stresses in the outer martensitic section and thereby stabilizes said ball against break up as caused by balancing tensile stresses in the pearlitic core exceeding the tensile strength of the core.